NPL-U7-3-220-K

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BEFORE THE UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

| | |
|---|---|
| IN THE MATTER OF THE PROPOSED LISTING OF RICHARDSON FLAT TAILINGS, SUMMIT COUNTY, UTAH, ON THE NATIONAL PRIORITIES LIST | COMMENTS OF UNITED PARK CITY MINES COMPANY IN OPPOSITION TO PROPOSED RULE |

United Park City Mines Company ("United Park") hereby respectfully submits its comments in opposition to the proposal of the Environmental Protection Agency ("EPA"), published in the Federal Register of June 24, 1988, to list Richardson Flat Tailings, Summit County, Utah, on the National Priorities List ("NPL").

As set forth more fully below, EPA has no rational basis or legal authority to list the Richardson Flat site on the NPL. First, EPA's Hazard Ranking System ("HRS") score for the site is based upon significant factual errors and incorrect assumptions. When the site is rescored on the basis of correct information, the HRS score is significantly lower than the threshold score of 28.5. In addition, in order to accurately and fairly score the site, the EPA should use the revised HRS, rather than the existing HRS, since EPA has decided to use the revised HRS to score the Prospector Square tailings site. Finally, EPA has failed to comply with Sections 105(g)(2)(A) and (B) of the Superfund Amendments and Reauthorization Act of 1986 ("SARA")

and, consequently, has no legal authority to add the Richardson Flat site to the NPL.

I. EPA'S HRS SCORE IS BASED UPON SIGNIFICANT FACTUAL ERRORS AND INCORRECT ASSUMPTIONS.

EPA's HRS score for the Richardson Flat site, as prepared for EPA by the consulting firm of Ecology and Environment, Inc. ("E&E"), is seriously flawed by several significant factual errors and incorrect assumptions. When such errors are made in the scoring of a site, the site should be rescored before such errors cause the site to be erroneously added to the NPL. See 132 Cong. Rec. S14935-36 (daily ed. Oct. 3, 1986) (statements of Senators Chiles and Stafford).

Consequently, the independent environmental consultants Multitech Services Division of MSE, Inc., Butte, Montana ("MSE") have rescored the Richardson Flat site using correct factual information and assumptions pursuant to the guidelines in Appendix A to 40 C.F.R. Part 300 -- "Uncontrolled Hazardous Waste Site Ranking System; A Users Manual" (hereinafter "the HRS Users Manual"), as developed by the Mitre Corporation for EPA. MSE's report, scoring forms, and data sheets are attached hereto and incorporated herein as Exhibit "D."

The following is a discussion of the factual errors and incorrect assumptions which were made in the preparation of EPA's

HRS score for the site and the correction of these significant errors. Because EPA only scored the Surface Water and Air Routes for the site and did not score the Groundwater Route, corrections are only applied to the Surface Water and Air Route scores. The worksheets found in the HRS Users Manual for the Surface Water Route (HRS Users Manual, Figure 7) and the Air Route (HRS Users Manual, Figure 9) were followed in rescoring the site. Likewise, the scoring guidelines presented in Section 4.0: Surface Water Route and Section 5.0: Air Route of the HRS Users Manual were used to rescore the site, using EPA's existing HRS scoring technique. As discussed in Sections II and III of these Comments, the existing HRS does not accurately assess the degree of hazard posed by a mining waste site, such as Richardson Flat. However, in order to show the errors made in the preparation of EPA's HRS score for Richardson Flat, MSE has rescored the site using the guidelines and worksheets for the existing HRS. (Section numbers used below refer to sections of the HRS Users Manual.)

Section 4.0: SURFACE WATER ROUTE

Section 4.1: OBSERVED RELEASE

The score for Observed Release for the Surface Water Route should be 0 because no release is demonstrated by the data collected during June 1985 by EPA's contractor E&E. The sample listed as downgradient (RT-SW-3) was collected at the railroad

trestle at Keetley Junction, as per Figure 2 of both the Analytical Results Report and the Report of Sampling Activities, telephone communication of August 8, 1985 between Ms. Sue Kennedy of E&E and Kerry Gee, United Park, and as described on the Chain of Custody Record (attached hereto as Exhibit "A") given to United Park for its splits of samples received on June 20, 1985. This location is, in fact, upgradient from any hydrologic influence of the Richardson Flat tailings (see Map 1 attached hereto). The map (Figure 2) provided in E&E's Report of Sampling Activities and Analytic Results is grossly in error and Map 1, attached hereto, illustrates the correct hydrologic and spatial relationships in question.

United Park is required, under its National Pollutant Discharge Elimination System ("NPDES") permit to sample Silver Creek at an upgradient and a downgradient location from the Richardson Flat tailings. In addition, United Park is to sample the man-made diversion ditch that diverts natural runoff water around the pond. These have been Utah State Health Department requirements of each NPDES permit issued to the operators of the Richardson Flat Tailings Pond since the first permit was issued to Park City Ventures in 1975. These were also some of the original conditions under which the tailings pond was approved by the State of Utah in 1974 (See Construction Permit attached hereto as

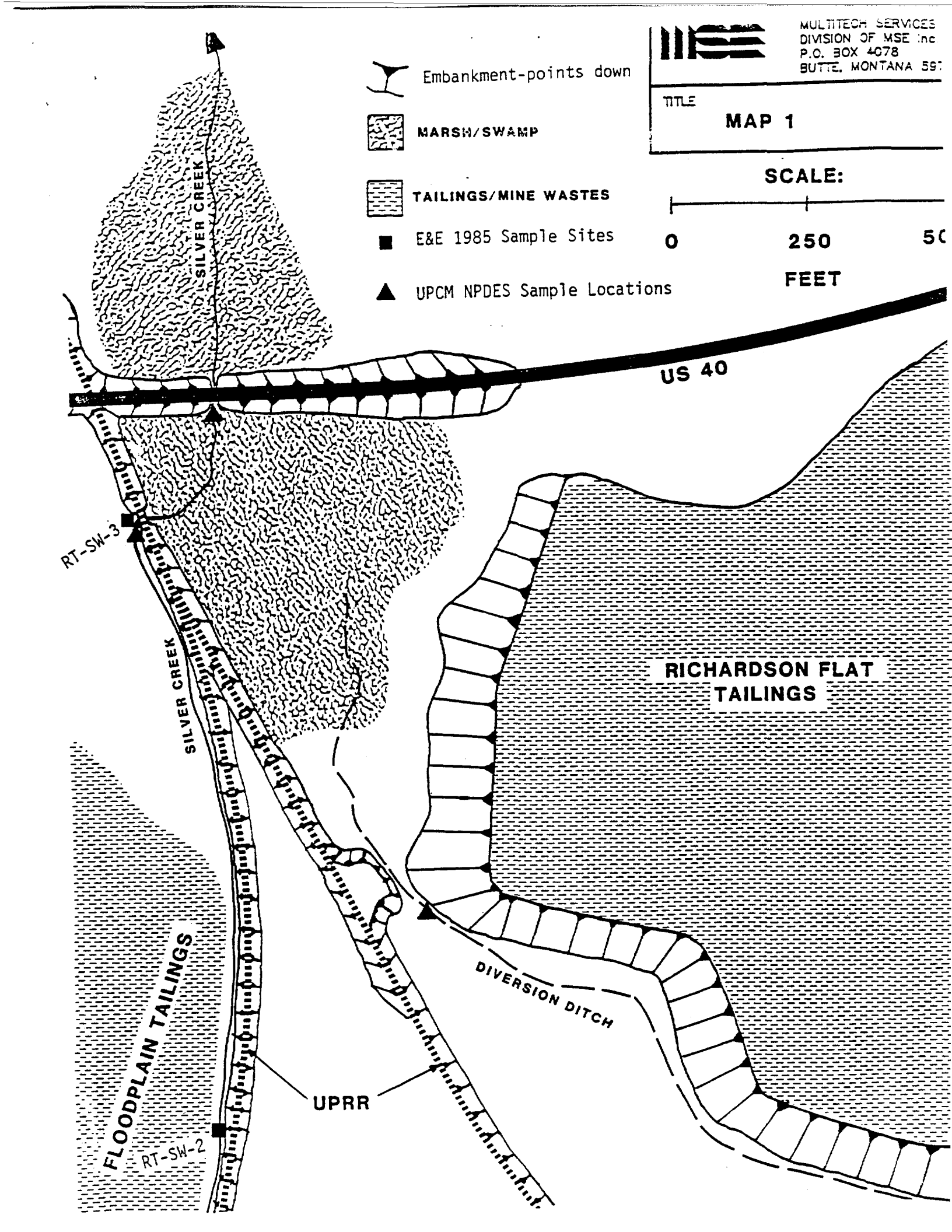

MULTITECH SERVICES
DIVISION OF MSE Inc
P.O. BOX 4078
BUTTE, MONTANA 597
TITLE
MAP 1
SCALE:
0
250
FEET
Embankment-points down
MARSH/SWAMP
TAILINGS/MINE WASTES
E&E 1985 Sample Sites
UPCM NPDES Sample Locations
SILVER CREEK
US 40
RT-SW-3
SILVER CREEK
RICHARDSON FLAT
TAILINGS
DIVERSION DITCH
FLOODPLAIN TAILINGS
UPRR
RT-SW-2

Exhibit "B"). The sample site at the railroad trestle, which E&E characterizes as the "downgradient" sample site, is United Park's upgradient NPDES sampling location. As shown on Map 1, the railroad grade forms a barrier between the Richardson Flat tailings and Silver Creek. Any influences from the diversion ditch or any seepage from the tailings dam would be restricted by the railroad grade and prevented from intermingling with Silver Creek. As shown on Map 1, any influence from Richardson Flat tailings would have to enter Silver Creek through the marsh between the railroad trestle (E&E's RT-SW-3 sampling location) and the culvert under US-40 (United Park's downgradient sample location). Therefore, the correct sampling locations to measure possible releases from Richardson Flat correspond to those regularly sampled by United Park pursuant to its NPDES requirements; that is: the upstream sample at the railroad trestle and the downstream sample at the culvert under US-40. These locations have been regularly sampled since 1977 under the NPDES permit and the NPDES data have been analyzed and are summarized below:

Mean Total Pb Values for 35 Pairs of NPDES Samples Collected on Silver Creek from 1983 to 1988

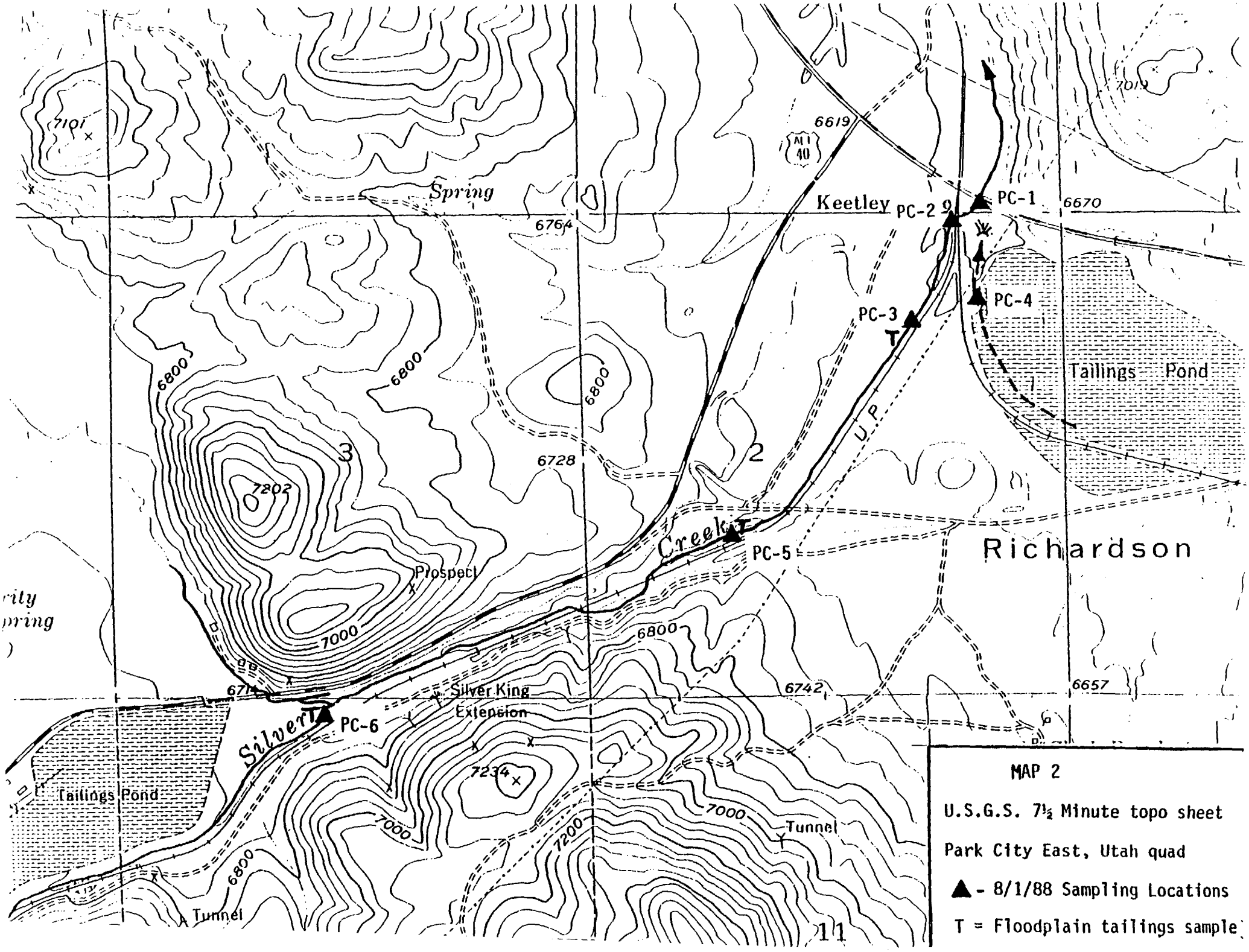
| | Railroad Trestle Upstream Location | US-40 Culvert Downstream Location | Difference (Downstream-Upstream) |
|---|---|---|---|
| Total Pb (mg/L) | 0.1418 | 0.1414 | -0.0004 |

MSE has analyzed statistically the NPDES data using F-tests (analysis of variance) and T-tests (both the two-independent-sample and paired-difference tests). These tests demonstrate conclusively that the upstream and downstream populations are indistinguishable from one another. The Two-Sample T-Test shows that the means of the two populations (upstream and downstream) are not significantly different at the 99.5% confidence level. At the 94% confidence level, the variances are not significantly different either. The Paired-Difference T-Test shows that the average difference is not significantly different from zero, at the 98% confidence level. The mean difference is -0.0004 (upstream is higher). Therefore, using existing NPDES data, there is no rationale for suspecting, much less scoring, an "observed release" from the Richardson Flat tailings to Silver Creek.

The difference found between RT-SW-1 and RT-SW-3 in E&E's sampling is most likely due to the inclusion of suspended solids in the samples. A review of aerial photos, a ground check and several samples (see Map 2 attached hereto and MSE's Table 5) confirm that portions of the Silver Creek flood plain are covered with stream deposited tailings emanating from Prospector Square. Consequently, the suspended sediment load within the stream can contain an abundance of tailings materials. Total metals

analyses reflect these suspended tailings in the stream water and show a great deal of variance depending on sampling methodology, sampling locations, and seasonal variables (spring runoff, storms, dry periods, or irrigation withdrawals). These factors can easily account for the high metal concentrations found in RT-SW-3 by E&E in 1985. Filtered water samples are specific to dissolved metals and eliminate the influence of suspended particulate material. Thus, filtered samples provide a more accurate measure of metal content in the water available for uptake by plants, humans, and livestock. Table 2 in MSE's Report compares total and dissolved metal concentrations found by MSE in Silver Creek on August 1, 1988 (locations correspond to those on Map 2). These data illustrate the significant differences which exist between dissolved and total metal values at the same sampling location, with total metal concentrations as much as 18 times higher than dissolved metals. These data support the hypothesis that metal levels observed by E&E in 1985 are primarily due to suspended sediments, probably derived from floodplain and streambank tailings deposits along Silver Creek.

MSE's samples, as discussed in MSE's attached Report and Tables 3-5, show that stream sediment is derived from Prospector Square tailings. MSE's stream sediment samples also


PC-1
PC-2
PC-3
PC-4
PC-5
PC-6
T
Keetley
Spring
Creek
Silver
Richardson
Tailings Pond
Tailings Pond
Prospect
Silver King
Extension
Tunnel
Tunnel
U.P.
6619
6764
6728
6742
6670
6657
7101
7202
7234
6800
7000
7200
MAP 2
U.S.G.S. 7½ Minute topo sheet
Park City East, Utah quad
▲ - 8/1/88 Sampling Locations
T = Floodplain tailings sample

clearly demonstrate a decay of metal concentrations with distance from Prospector Square tailings.

In summary, the 1985 sampling along Silver Creek was clearly flawed. No downstream sample was collected, and hence, no release can be attributed to Richardson Flat. The NPDES data properly collected at upstream and downstream locations show no statistical difference between the upstream and downstream locations. The increase observed in 1985 can be attributed to suspended solid-phase metals which originated upstream and reside in Prospector Square's floodplain.

Since no direct evidence of an observed release was documented, Section 4.2 (Route Characteristics) and Section 4.3 (Containment) of the HRS must be evaluated instead.

Section 4.2: ROUTE CHARACTERISTICS

a. Facility Slope and Intervening Terrain

Table 8 of the HRS Users Manual indicates a score of 0 for this factor. The Richardson Flat tailings are a closed basin. Any rainwater that falls on the Richardson Flat tailings is contained on the tailings and cannot escape to surface water. The diversion ditch around the tailings embankment prevents runoff from draining into the tailings pond. Higher intervening terrain (diking) isolates the tailings from surface water. The score for this factor is then, clearly, 0.

b. One-Year 24-Hour Rainfall

The map at Figure 8 of the HRS Users Manual shows that the area may receive 1.25 inches of rain in a 24-hour period. The assigned value for this factor is 1.

c. Distance to Nearest Surface Water

This distance of the Richardson Flat tailings from Silver Creek is less than 1,000 feet, resulting in an assigned value of 3 for this factor.

d. Physical State

Pursuant to the table at Section 3.2 of the HRS Users Manual, the physical state of the Richardson Flat tailings is that of a solid, unstabilized/unconsolidated material. The assigned value for this factor is 1.

Total Route Characteristics

Using the appropriate HRS multipliers, the Total Route Characteristics (Section 4.2) score is 8.

Section 4.3: CONTAINMENT

As defined in Table 9 of the HRS Users Manual, Richardson Flat tailings is considered a Surface Impoundment (Group A). The impoundment has sound diking and a sound diversion structure (diversion ditch), but may have inadequate freeboard for very large precipitation events. Accordingly, the assigned value for this factor is 1.

Section 4.4: WASTE CHARACTERISTICS

a. Toxicity/Persistence

The HRS requires the evaluation of substances in the form in which they are found at the site. The form of the metals found in the Richardson Flat tailings is important with respect to toxicity. E&E's analysis of tailings samples collected indicate the presence of lead, copper and arsenic. These metals are judged to be highly toxic in Dangerous Properties of Industrial Materials (5th edition) by N. Irving Sax. For this reason, they were given the highest toxicity/persistence rating in the HRS scoring, that is 18. However, available information indicates that these metals are present in the tailings as generally low toxicity sulfide compounds, not in elemental forms as assumed in the previous scoring. In addition, the pH of the tailings is neutral.

The Updated Site Investigation Form (p.5), included in the HRS summary package in Appendix IV to the Analytical Results Report of Air Sampling at Richardson Flat, identifies the tailings as "metal sulfide, and carbonate-containing tailings material." Sax, Dangerous Properties of Industrial Materials (5th ed. at p. 1000 and 6th ed. at p. 2482) states: "Sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide."

As reported in the Report of Sampling Activities, Richardson Flat Tailings, Summit County, Utah, TDD R8-8505-27 (p.9), prepared by E&E in September of 1985, the "Field pH's of surface and subsurface tailings range from 6.88 to 7.54." The neutral pH of the tailings adds to the stability of the sulfide compounds.

The sulfide compounds exist as a constituent of the tailings. When EPA's analysis of the tailings is made for heavy metals, the results show that heavy metals are present. However, this analysis does not show the form of the metal; the metal is not in its free state or elemental form, but is a part of a compound. Therefore, the quantity, toxicity and concentration of the compound as a constituent of the tailings must be used when assessing the threats posed by any release. Using only the element to assess these threats is misleading and would be similar to analyzing table salt for sodium and chlorine or dental amalgam for mercury. Both contain highly toxic elements but, when combined with other elements to form compounds, the toxicity is greatly reduced.

Based on the available information concerning the toxicity of the sulfide compounds as constituents of the tailings, the toxicity of this Special Study Waste should be assigned a value of 1 as opposed to the value of 3 given in the scoring

completed by E&E. The score completed by E&E does not consider the form of the substance at the site and all available information.

Sulfide compounds are not easily degraded and are particularly stable at the Richardson Flat Site due to the pH and carbonate nature of the tailings. Therefore, the persistence of the sulfide constituent should be assigned a value of 3. This is equal to the value assigned in the scoring completed by E&E. Based on the above information, the matrix in Section 3.4 of the HRS Users Manual then shows the combined Toxicity/Persistence value to be 12.

b. Waste Quantity

The quantity of tailings at the Richardson Flat tailings site is unknown. E&E has erroneously stated that Kerry Gee, a geologist for United Park, estimated a quantity of tailings in excess of 2 million tons at a depth varying from 0 to 10 feet, in a telephone conversation with Jeff Holcomb of E&E on July 12, 1985. Mr. Gee made no such statements in this telephone conversation. Indeed, Mr. Gee told Mr. Holcomb that he could not determine the volume of tailings at the site and that such a determination would be extremely difficult. Mr. Gee's telephone conversation with Jeff Holcomb on July 12, 1985 is summarized in Mr. Gee's letter of July 18, 1985 to Mr. Holcomb, a copy of which

is attached as Exhibit "C" hereto. (Pursuant to United Park's request, the EPA has obtained from E&E a copy of Mr. Gee's letter.)

The tailings are comprised primarily of harmless forms of country rock, such as quartz and limestone, with only trace amounts of metals. Thus, the total quantity of tailings at the site is far greater than the minute amounts of hazardous substances which may be constituents in the tailings. The assumption inherent in the existing HRS that the total volume of tailings equals the quantity of hazardous waste creates the inaccuracy and bias in the existing HRS which has been noted by Congress in the Superfund Amendments and Reauthorization Act of 1986 (SARA). Using the actual amounts of hazardous constituents in the tailings, as stipulated in Section 105(g) of SARA, may yield a significantly lower assigned value for waste quantity.

Nevertheless, in order to rescore the site pursuant to the existing HRS, the total volume of the low concentration sulfide tailings is assumed to be the "hazardous waste quantity" and the volume of the tailings is assumed to be greater than 2,500 cubic yards. With these assumptions made under the existing HRS, the assigned value for this factor is 8.

Total Waste Characteristics

The Total Waste Characteristics (Section 4.4) score is, therefore, 20.

Section 4.5: TARGETS

a. Surface Water Use

The only use of Silver Creek water is for irrigation of pasture crops. The assigned value for this factor is 2.

b. Distance to Sensitive Environment

No sensitive environments or critical habitats have been identified within one mile. The assigned value for this factor is 0.

c. Population Served by Surface Water

Review of irrigation practices downstream on Silver Creek indicate that the only useable irrigation diversion is more than 2,000 feet downstream from the culvert under US-40 (not less than 1,000 feet downstream as reported by E&E). In calculating the downstream point of diversion for irrigation water from Silver Creek and the number of acres irrigated with this water, E&E has relied upon the hydrologic plats and water usage information compiled by the Utah State Engineer in the 1920's for the Weber River Decree. See HRS Summary Reference 7 (Jess Anderson, former Weber Area Engineer, reading information from Weber River Decree), and References 12, 12a, 12b and 12c (the Weber River

Proposed Determination (1924), the Weber River Decree (1937), and plats prepared for the Weber River Proposed Determination (pre-1924)). While this information may have been accurate in the 1920's, it is woefully out of date in the 1980's. An on-the-ground review of the downstream point of diversion for irrigation water from Silver Creek reveals that the diversion has been moved north since the 1920's and now occurs more than 2,000 feet downstream from the culvert under US-40. The location of Silver Creek has also changed from the location on the 1920's hydrologic plat (HRS Summary Reference 12c) and, accordingly, the sampling site noted by E&E on the plat is also incorrect.

The number of acres irrigated by this water should be sought from the owner of the water right and actual user of the water, not from the out-of-date Weber River Decree documents (HRS Summary References 12-12c) or a conversation with an employee of a local land development firm (HRS Summary Reference 8). Nevertheless, the "population served" value (using the 1.5 person/acre calculation) used by E&E will be used here -- 474 persons (316 acres). Pursuant to the HRS matrix under Section 4.5 of the HRS Users Manual, the assigned value for this factor is 16.

Total Targets

Using the appropriate HRS multipliers, the Total Targets (Section 4.5) score is 22.

Section 4.6: CALCULATE SURFACE WATER ROUTE SCORE

Multiplying values of Sections 4.2, 4.3, 4.4 and 4.5 yields 8 x 1 x 20 x 22 = 3520.

Dividing by 64,360 and multiplying by 100 yields a $S_{SW}$ = 5.47.

Section 5.0: AIR ROUTE

Section 5.1: OBSERVED RELEASE

The primary evidence used by E&E to document the "observed release" for the Air Route is the data collected during one day of E&E's five-day air sampling during July 1986. This one day is not representative of either the direction or magnitude of winds at the site, considering the rest of the data collected during that week. Neither does this one-day's sample exceed the ambient lead standard of 1.5 ug/$m^3$ because the EPA ambient lead standard is a quarterly (3 month) average, not a 24-hour standard. No 24-hour standard currently exists. If the measurements for the downwind station (AM-04) are averaged for the entire sampling period in July, the result is 0.38 ug/$m^3$, roughly 25% of the quarterly standard.

However, according to the guidelines for scoring the HRS, no standards need be exceeded; a contaminant need only "significantly exceed background levels" in order to be termed an "observed release." Likewise, the fact that the elevated level

occurred only once during the sampling period, during an unusual storm event, is also irrelevant according to the existing HRS, since a release is shown "regardless of the frequency of occurrence." See HRS Users Manual Section 5.1.

The exposed tailings are currently 70% covered with topsoil and will be completely covered and seeded in the future. This covering will preclude the airborne release of tailings materials from Richardson Flat.

The existing HRS scoring guidelines are clearly lacking in technical accuracy in the measurement of the air route. Nevertheless, in order to rescore the site using the existing HRS, an "observed release" was scored based on the one day of data collected by E&E in July 1986. Under the existing HRS guidelines, Section 5.1: Observed Release is given the score of 45.

Section 5.2: WASTE CHARACTERISTICS

a. Reactivity and Incompatibility

Although arsenic is in the tailings, its form is not elemental. The arsenic is bound within a sulfide mineral matrix and cannot be considered a reactive compound. No incompatible substances are present at the site. The assigned value for this factor is 0.

b. Toxicity

Again, metals at the site are not in elemental forms, they are primarily found as sulfide compounds. Sax, Dangerous Properties of Industrial Materials, 6th Ed., states that "Sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide." Therefore, these sulfide compounds should be given a toxicity rating of 1.

c. Waste Quantity

As previously discussed under Section 4.4.b., the quantity of tailings and the quantity of hazardous substances at this site are unknown. Under the existing HRS guidelines, the inclusion of the entire volume of tailings under the term "waste quantity" demonstrates the bias of the existing HRS against mining sites. Nevertheless, in order to rescore the site using the existing HRS guidelines, the entire volume of the low concentration sulfide tailings is assumed to be greater than 2,500 cubic yards and the assigned value for this factor is 8.

Total Waste Characteristics

Using the HRS multipliers, the Total Waste Characteristics score is 11.

Section 5.3: TARGETS

a. Population Within a 4-Mile Radius

The original HRS scoring includes the entire population of Park City, Utah, disregarding the intervening mountains and the substantial evidence that both Prospector Square (1.5 miles away) and central Park City (one mile beyond Prospector Square) are not affected by tailings from Richardson Flat. The 1988 Analytical Results Report for Ambient Air and Residential Characterization at Prospector Square, Park City, Utah, prepared by Dave Franzen, et al., E&E ("the 1988 Prospector Square Air Report") analyzed data collected on three sampling days when the Prospector Square tailings were downwind from the Richardson Flat tailings, in order to determine whether entrained metals from Richardson Flat contributed to contaminant levels at Prospector Square. The 1988 Prospector Square Air Report (p. 23) concluded:

> The tailings ponds at Richardson Flat did not appear to contribute to contaminant levels detected at Prospector Square on any of the sampling days that winds were recorded blowing from Richardson Flat to Prospector Square. It therefore appears that measurable levels of contaminants were not blown the 1.5 mile distance between the two sites by winds with average speeds of 10 to 30 miles per hour.

The airflow path between the Richardson Flat and Prospector Square sites is fairly unrestricted, while Richardson Flat and Park City are separated by hills 400-600 feet high. No

impacts from Richardson Flat were observed at Prospector Square during the 1987 sampling, hence impacts from Richardson Flat upon Park City would be highly unlikely (central Park City is at least one mile farther from Richardson Flat than is Prospector Square).

The 1988 Prospector Square Air Report also examined variations in metal levels at various distances from the Prospector Square tailings site. The Report determined that mean lead concentrations 200 feet from the Prospector Square tailings site were 66.5% of those observed adjacent to the site. Assuming similar behavior at the Richardson Flat site, the highest lead level observed 200 feet off-site would be only 1.0958 $ug/m^3$ (versus the 1.6478 $ug/m^3$ level observed on site). This 24-hour reading would be considerably below the quarterly standard of 1.5 $ug/m^3$.

In summary, while there is evidence that increased metals concentrations can occur immediately downwind of the Richardson Flat tailings, these have been shown, by the 1988 Prospector Square Air Report, to be unmeasurable at a distance of 1.5 miles over unrestricted terrain. It also appears that ambient lead levels, even during extreme conditions, decrease rapidly with distance off-site. There is no evidence that the National Ambient Air Quality Standards ("NAAQS") for lead are being violated, even on the Richardson Flat site itself.

The existing HRS does not consider the demonstrated unmeasurable effects on populations (1988 Prospector Square Air Report). However, data clearly demonstrate that Richardson Flat tailings do not pose a health hazard to Park City residents. Since these tailings are Special Study Wastes, a potential hazard to human health or the environment must be demonstrated. Clearly, the 1988 Prospector Square Air Report proves that no health hazard exists and no standards were exceeded in the vicinity of Park City due to Richardson Flat tailings. Hence, that population cannot be included as targets of an actual or potential release of airborne contaminants from Richardson Flat tailings. The actual target population is less than 100 persons within a one-mile radius of the site, resulting in an assigned value of 12.

b. Distance to a Sensitive Environment

No sensitive environments or critical habitats exist within one mile of the site. Therefore, the assigned value for this factor is 0.

c. Land Use

Because agricultural land is within 1/4 mile of Richardson Flat, the assigned value for this factor is 3.

Total Targets Score

The Total Targets score is 15.

Section 5.4: CALCULATE AIR ROUTE SCORE

According to the HRS, the Air Route score is calculated as follows:

Multiply Sections 5.1 x 5.2 x 5.3:

45 x 11 x 15 = 7,425

Divide by 35,100 and multiply by 100:

$S_a$ = 21.15

CALCULATION OF $S_M$ SCORE

Use of the Figure 10 Worksheet of the HRS Users Manual to compute the Migration Hazard Mode Score ($S_M$) yields the following:

| | S | $S^2$ |
|---|---|---|
| $S_{gw}$ | 0 | 0 |
| $S_{sw}$ | 5.47 | 29.92 |
| $S_a$ | 21.15 | 447.32 |
| $S_M$ | | 12.63 |

The $S_M$ score for Richardson Flat tailings is not nearly high enough to meet the criteria set by EPA for inclusion on the NPL ($S_M$ must be greater than 28.5). Additionally, the direct contact score should be reduced to zero, since the exposed

tailings are currently 70% covered with topsoil and will be completely covered and seeded in the future.

When the Richardson Flat site is rescored using valid facts and assumptions, the score is significantly less than the threshold 28.5 necessary for listing on the NPL. This is true even when the site was rescored pursuant to the existing HRS guidelines which are acknowledged to be biased against mining sites. Consequently, the Richardson Flat site should not be listed on the NPL.

II. THE REVISED HAZARD RANKING SYSTEM SHOULD BE USED TO SCORE THE RICHARDSON FLAT SITE, JUST AS THE REVISED HAZARD RANKING SYSTEM WILL BE USED TO SCORE THE PROSPECTOR SQUARE SITE.

The Superfund Amendments and Reauthorization Act of 1986 ("SARA"), enacted October 17, 1986, requires that the Hazard Ranking System ("HRS") be amended in order that it might "accurately assess the relative degree of risk to human health and the environment posed by sites." 42 U.S.C. § 9605(c)(1). The amended HRS must be promulgated no later than 18 months after the enactment of SARA (October 17, 1986) and must be effective no later than 24 months after enactment of SARA. Id. Consequently, the amended HRS should have been promulgated in April 1988 and must be effective in October 1988.

Congress required that the existing HRS be amended because the existing HRS does not accurately assess the human

health and environmental risk at various sites, particularly mining waste sites. The problems of the existing HRS or so-called "Mitre Model" are addressed in the Senate Environment Committee Report:

> The present hazard ranking system based on the so-called Mitre Model has been criticized for failing to assess accurately the relative degree of hazard posed by various sites and facilities. The purpose of the hazard ranking system is to indicate degree of hazard or risk in order to determine whether a site or facility should be placed on the National Priority List. In particular, the validity of the present hazard ranking system has been questioned for identifying the degree of hazard or risk posed by mining sites. The hazard ranking system appeared to identify the most hazardous constituent at a site, quantify the total amount of wastes at the site, then assume that all of the waste is comprised of the most hazardous constituent. This could introduce a bias in the hazard ranking system against large quantities of waste with the presence of trace toxic metals, such as typical mining wastes.

Senate Report (Environmental and Public Works Committee) No. 99-11, March 18, 1985 at 40 [emphasis added]. Senator Baucus summarized Congress' concern regarding the accuracy of the existing HRS:

> Considerable concern has been raised that the current Hazard Ranking System does not adequately consider the toxicity concentration of hazardous constituents which are present in any release or threatened release.
>
> The Hazard Ranking System review was included in these amendments in recognition of the unique problems posed by high volume, low toxicity sites, such as mine waste sites. Considerable concern has been raised that the current Hazard Ranking System unfairly ranks these types of sites.

132 Cong. Rec. S14931 (daily ed. Oct. 3, 1986) (statement of Senator Baucus) [emphasis added].

The Richardson Flat tailings site is a mining waste site which cannot be accurately assessed under the existing HRS. As more fully discussed in Sections III.A. and B. of these Comments, the existing HRS does not, and cannot within its guidelines, accurately assess the issues of quantity, toxicity and concentration of hazardous substances that are constituents of the mining waste at the Richardson Flat site. Neither can the existing HRS accurately assess the population actually affected by the hazardous constituents at the site or the degree of hazard posed to human health or the environment by a potential release of hazardous constituents from the site.

Because the existing HRS is clearly an unsuitable model to use for assessing the risk at the Richardson Flat site, the EPA should score the site under the revised HRS. The EPA has the ability to exercise discretion and prudence in this situation and may choose to score the site under the revised HRS. 42 U.S.C. § 9605(c); see 131 Cong. Rec. S11682 (daily ed. Sept. 18, 1985) (statement of Senator Bentsen: EPA may choose to await the outcome of the HRS revision before proceeding with a mine tailings pond).

Instead, the EPA is rushing the Richardson Flat site through the listing process under a clearly inappropriate scoring system in order to justify its collection and utilization of scoring data which is now inaccurate and misleading and may well be incomplete and insufficient under the revised HRS. In other words, the EPA is willing to sacrifice the accuracy and fairness of the NPL listing process for the Richardson Flat site in order to "save" and utilize the flawed technical data collected on the site and the site scoring package, which may otherwise prove unuseable and obsolete under the revised HRS. In its Proposed Rule, published in the Federal Register June 24, 1988, proposing the listing of Richardson Flat, the EPA admits to rushing the proposed sites through the listing process prior to the effective date of the revised HRS:

> In past NPL rulemakings, EPA has considered, to the extent practicable, comments received after the close of the comment period. EPA will attempt to do so in this rulemaking as well. However, because of the larger number of sites proposed, and the need to respond to comments and finalize sites prior to the effective date of the revised HRS, EPA may no longer be able to consider late comments.

53 Fed. Reg. 23990 (1988) [emphasis added].

Likewise, EPA has failed to apply its scoring system fairly and equally to similar sites. For example, EPA has stated that it will score the Prospector Square (Silver Creek) site in

Park City, Utah, (just 1.5 miles west of the Richardson Flat site) under the revised HRS, even though it has the authority to utilize the existing HRS for this site. See Superfund Amendments and Reauthorization Act of 1986, § 118(p). The 1988 Prospector Square Air Report (p.4) provides: "Any new HRS score prepared for the site [Prospector Square] will use the revised HRS currently under preparation by EPA."

The Prospector Square (Silver Creek) tailings site is located about 1.5 miles from the Richardson Flat tailings site. Both sites are similar in that mill waste tailings are present at each site. As mine waste (Special Study Waste) sites, neither Richardson Flat nor Prospector Square can be accurately and fairly assessed under the existing HRS. Owners of both sites deserve to be treated equally and fairly by any agency of the United States and to receive equal protection under the law. In its Comments in opposition to the proposed listing of Silver Creek Tailings (Prospector Square), dated November 15, 1985, Park City Municipal Corporation, in reference to the Prospector Square tailings site and the Richardson Flat tailings site, states: "The owners of both facilities are entitled to an equal application of scientific standards to these essentially identical facilities." Park City's Comments at p. 28.

By rushing the Richardson Flat tailings site through the listing process under the existing HRS scoring system and waiting to score the Prospector Square tailings site under the revised HRS, EPA is essentially denying the two sites the equal application of scientific standards. EPA has the authority and the obligation to utilize the revised HRS to score the Richardson Flat tailings site as well as the Prospector Square tailings site. EPA's use of the existing HRS to score the Richardson Flat site is arbitrary, capricious, and an abuse of discretion.

III. EPA HAS NOT ADDRESSED THE SITE-SPECIFIC SPECIAL STUDY WASTE FACTORS AT THE RICHARDSON FLAT SITE, AS REQUIRED PURSUANT TO SECTION 105(g) of SARA.

Because the existing HRS does not accurately assess the degree of risk at mining waste sites, Congress has required that, until the revised HRS is effective, the EPA must specifically consider the following site-specific factors for each mining waste site proposed to be listed on the NPL:

> (A) The extent to which hazard ranking system score for the facility is affected by the presence of any special study waste at, or any release from, such facility.
>
> (B) Available information as to the quantity, toxicity, and concentration of hazardous substances that are constituents of any special study waste at, or released from such facility, the extent of or potential for release of such hazardous constituents, the exposure or potential exposure to human population and the environment, and the degree of hazard to human health or the environment posed by the release of such hazardous constituents at such facility. This subparagraph refers

only to available information on actual concentrations of hazardous substances and not on the total quantity of special study waste at such facility.

Section 105(g)(2)(A) and (B) of SARA, codified at 42 U.S.C. § 9605(g)(2)(A) and (B) (1986).

EPA's consideration of and findings for these site-specific factors for a mining waste site are the most important parts of EPA's review of a mine waste site. Congress specifically required that EPA review site-specific factors for a mine waste site and make specific findings in order to prevent a mine waste site from being improperly listed on the NPL due to a high HRS score which misrepresents the actual health and environmental risk at the site. Congress regarded the required Special Study Waste findings for a proposed site as the safeguard for mine waste sites during the interim period while the HRS is being revised:

> Until the HRS is properly revised, special study waste sites--including abandoned mine site leachate--may be listed on the NPL only if the Administrator of EPA makes the required specific findings based on facility-specific data. Liability for costs, damages, or penalities may be imposed for the sites which are so listed, but only if the requisite specific findings have been made and only if the Administrator in court supports each of these specific findings with appropriate facility-specific data.
>
> * * *
>
> [T]he MITRE model will be revised to accurately reflect comparative risk on a site-specific basis; in the interim, special study waste sites--or abandoned

> mine drainage areas--could be listed on the NPL if they present a genuine and substantial risk, but certain safeguards would be put into place to assure that proper site-by-site assessment of risk is undertaken before this is done and that higher priority sites are listed first.

131 Cong. Rec. S11682 (daily ed. Sept. 18, 1985) (statement of Senator Baucus) [emphasis added].

The required review of site-specific factors (42 U.S.C. § 9605(g)) was not intended to be merely a summary of the HRS scoring data, so that EPA could continue to list sites pursuant to the existing HRS during the interim period. See 131 Cong. Rec. S11681 (daily ed. Sept. 18, 1985) (statement of Senator Baucus). The EPA's consideration and findings as to site-specific data are required as an independent review, not based upon the theoretical Mitre model, but upon actual information as to the constituents of the mining waste, the exposure of human population and the environment, and the health and environmental hazards posed at the site:

> The new HRS must assure that the relative degree of risk posed by such sites is assessed; and pending these revisions, the EPA must make site-specific findings before listing special waste sites. These additional requirements will necessitate additional moneys for more thorough site assessments before listing in order to develop the necessary information to make site-specific findings and usefully compare sites.

131 Cong. Rec. S12028 (daily ed. Sept. 24, 1985) (statement of Senator Garn) [emphasis added].

> During the interim period while the Hazard Ranking System is being reviewed, in determining whether to list mining waste sites . . . the President is to ensure that adequate consideration is given to onsite factors and to the specific nature of a site, prior to its inclusion on the national priorities list.

132 Cong. Rec. S14931 (Oct. 3, 1986) (statement of Senator Baucus) [emphasis added].

In spite of the statutory mandate in Section 105(g) of SARA and the clear intent of Congress as to the importance of this review of site-specific factors independent of the HRS, EPA has not addressed the site-specific factors at the Richardson Flat site as required under Section 105(g) of SARA.

The following is a discussion of EPA's failure to comply with Section 105(g) of SARA and United Park's review of the factors included in Section 105(g).

A. EPA HAS ENTIRELY FAILED TO COMPLY WITH SECTION 105(g)(2)(A) OF SARA.

In its Memorandum entitled Special Study Waste Support Documentation, dated May 17, 1988, from Scott Parrish, Chief, Hazard Ranking and Listing Branch, to The Record, and its Special Study Waste Addendum for Richardson Flat Tailings, Summit County, Utah ("EPA's Memorandum and Addendum"), the EPA purports to fulfill all of the requirements of Section 105(g) of SARA (42 U.S.C. § 9605(g)). However, the Memorandum and Addendum do not even attempt to address 42 U.S.C. § 9605(g)(2)(A): "The extent to

which hazard ranking system score for the facility is affected by the presence of any special study waste at, or any release from, such facility." Without compliance with this section of the statute, EPA cannot propose to list Richardson Flat on the NPL.

Congress required a review of how a particular HRS score was affected by a Special Study Waste, such as mining waste, because Congress acknowledged that an HRS score may be inaccurately high and unreliable because of the existing HRS's bias against such Special Study Wastes.

The EPA's HRS score for Richardson Flat has been substantially inflated by the presence at the site of a large volume of mining waste, comprised primarily of harmless forms of country rock such as quartz and limestone, with only trace amounts of metals. Thus, the total quantity of tailings at the site is far greater than the minute amounts of hazardous substances which may be constituents in the tailings. The assumption inherent in the existing HRS that the total volume of tailings equals the quantity of hazardous waste creates the inaccuracy and bias in the existing HRS which has been noted by Congress in SARA.

The EPA's HRS score for Richardson Flat is also significantly increased by its scoring of the toxicity of metals in their elemental forms not found at the site, rather than its

scoring of the toxicity of the constituent sulfide compounds actually found in the mining waste.

Furthermore, the EPA's HRS score disregards the rural location of mining waste because it fails to consider such site-specific, physical features as the mountains, intervening terrain, and current irrigation practices in scoring the Target Population for the Air Route and the Surface Water Route at the site. The EPA's HRS score also fails to reflect the conclusion of the 1988 Prospector Square Air Report--that contaminants are <u>not</u> blown from Richardson Flat to Prospector Square. Such site-specific information about Richardson Flat does, in fact, exist, and EPA has failed to consider this site-specific information independently from the Mitre model, in its Addendum. This site-specific information would substantially lower the HRS score for Richardson Flat.

Since EPA has made no findings as to the effect of the mining waste on the HRS score, as required under Section 105(g)(2)(A) of SARA, EPA does not have the legal authority to add Richardson Flat to the NPL.

B. EPA HAS NOT ADDRESSED THE SITE-SPECIFIC FACTORS AT RICHARDSON FLAT, AS REQUIRED PURSUANT TO SECTION 105(g)(2)(B) OF SARA.

EPA's Memorandum and Addendum of May 17, 1988 avoid addressing the site-specific factors required under Section 105(g)(2)(B) of SARA by merely repeating the conclusions of EPA's HRS scoring for Richardson Flat. Instead of summarizing its findings under the theoretical Mitre model guidelines, EPA is required by the statute to look at the following site-specific factors outside of the context of the HRS:

> (B) Available information as to the quantity, toxicity, and concentration of hazardous substances that are constituents of any special study waste at, or released from such facility, the extent of or potential for release of such hazardous constituents, the exposure or potential exposure to human population and the environment, and the degree of hazard to human health or the environment posed by the release of such hazardous constituents at such facility. This subparagraph refers only to available information on actual concentrations of hazardous substances and not on the total quantity of special study waste at such facility.

42 U.S.C. § 9605(g)(2)(B) [emphasis added].

(1) Quantity of Hazardous Substances That Are Constituents of the Mining Waste. The EPA Memorandum and Addendum make no findings as to the actual quantity of hazardous substances that are constituents of the tailings. Instead, under the heading "Quantity," EPA states that "information obtained from United Park City Mines shows" that the depth of the tailings is zero to

ten feet and the total amount of tailings is in excess of two million tons. As discussed in Section I of these Comments and as shown in Mr. Gee's letter of July 18, 1985, (Exhibit "C" hereto) United Park has never given EPA an estimate of the volume of tailings at Richardson Flat. EPA's statement of United Park's estimate is unsupported and untrue. In any event, Section 105 (g)(2)(B) of SARA specifically does not require a finding of the total volume of mining waste, it requires a finding as to the quantity of hazardous-substance constituents in the mining waste.

Under the heading "Quantity" in its Addendum, the EPA also states that samples show "elevated concentrations" of various metals in the surface and subsurface samples. From one sample, the EPA makes the assumption that metals are migrating downward from the tailings into the soils. Kerry Gee, geologist for United Park, was present when this single sample was taken by EPA's contractor. According to Mr. Gee, the single sample of material which EPA's contractor identified as "soil" was so small that United Park did not receive a split of the sample. The sample was collected from a drillhole that had poor recovery and was drilled after the contractor's first drillhole would not stay open between sampling runs. This single sample was also contaminated by tailings during the sampling procedure because EPA's contractor used a rotary drill which allowed material from the

sides of the drillhole to slough off into and settle to the bottom of the drillhole during the sampling procedure, thereby contaminating the sample. Likewise, this single sample and the other surface and subsurface samples were tested for cyanide and total solids at the Versar, Inc. lab, which has provided no quality assurance data for its lab results. (It is EPA policy that a lab contracting with EPA must provide quality assurance data.[1/] As of August 19, 1988, neither Region VIII EPA nor E&E could locate any quality assurance data from Versar, Inc. for these sample results.)[2/] Thus, EPA's assumptions of "downward migration" of metals and a "tailings/soil contact at 17.8 feet" are based upon the misinterpretation of one insufficient and contaminated sample analyzed without the requisite quality assurance package from EPA's contract lab.

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1/ Letter dated August 12, 1988, from Lou Johnson, EPA, to Rosemary J. Beless, responding to United Park's Freedom of Information Act request for quality assurance data for 1985 lab results.

2/ Request for quality assurance data in telephone conference of July 26, 1988, from Kerry Gee, United Park geologist, to David Schaller, Region VIII EPA; United Park's Freedom of Information Act request for quality assurance data for 1985 test results, dated August 4, 1988; telephone conference of August 19, 1988, from Jay Silvernale, Region VIII EPA to E. L. Osika, Jr., United Park, confirming EPA's and E&E's failure to locate quality assurance data for Versar, Inc.'s sample results.

Moreover, none of EPA's statements under the heading "Quantity" or throughout its Memorandum and Addendum address the statutory issue: the quantity of hazardous-substance constituents in the tailings.

(2) Toxicity of Hazardous Substances That Are Constituents of the Mining Waste. The EPA Addendum addresses the toxicity of hazardous-substance constituents of the tailings only within the context of the HRS. Under the heading "Toxicity," EPA states: "Toxic components of the tailings include arsenic, copper and lead. These metals were determined to have the highest toxicity/persistence score for the Hazard Ranking System." The EPA and the existing HRS ignore the fact that arsenic, copper and lead are not found in their pure, elemental state in the tailings but in low toxicity sulfide compounds[3/] and that the pH of the tailings is neutral.[4/] Sax, Dangerous Properties of Industrial

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3/ The Updated Site Investigation Form (p.5), included in the HRS summary package in Appendix IV to the Analytical Results Report of Air Sampling at Richardson Flat, identifies the tailings as "metal sulfide, and carbonate containing tailings material."

4/ As reported in the "Report of Sampling Activities, Richardson Flat Tailings, Summit County, Utah, TDD R8-8505-27" (p. 9), prepared by E&E in September of 1985, the "Field pH's of surface and subsurface tailings range from 6.88 to 7.54."

Materials (5th ed. at p. 1000 and 6th ed. at p. 2482) states: "Sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide." The neutral pH of the tailings also adds to the stability of these sulfide compounds.

The sulfide compounds exist as a constituent of the tailings. When EPA's analysis of the tailings is made for heavy metals, the results show that heavy metals are present. However, this analysis does not show the form of the metal; the metal is not found in its free state or elemental form, but as a part of a compound. Therefore, the quantity, toxicity and concentration of the compound as a constituent of the tailings must be considered when assessing the threats posed by any Special Study Waste at or released from any facility. Using only the element to assess these threats is misleading and would be similar to analyzing table salt for sodium and chlorine or dental amalgam for mercury. Both contain highly toxic elements but when combined with other elements to form compounds, the toxicity is greatly reduced. Based on the available information concerning the toxicity of the sulfide compounds which are constituents of the tailings, the toxicity of these compounds is low (an assigned value of 1 under the HRS).

Under the heading "Toxicity" in EPA's Addendum, EPA also states: "Surface water samples collected downstream from the site exceeded MCLs for some metals." However, as discussed in Section I of these Comments, none of the samples taken by EPA's contractor were downstream from the Richardson Flat tailings. The samples taken from Silver Creek (which were all taken upstream from the effects of the Richardson Flat tailings) were unfiltered and analyzed for "total metals" instead of "dissolved metals." Therefore, it is probable that sediments within the samples contributed most of the metals found in the samples.

EPA has not taken a surface water sample which is downstream from Richardson Flat tailings. Likewise, EPA has not analyzed the toxicity of the metal compounds as they exist as constituents of the tailings on Richardson Flat. Therefore, EPA has not addressed the toxicity of hazardous substances that are constituents of the mining waste, as required under Section 105(g)(2)(B) of SARA.

(3) Concentration of Hazardous Substances That Are Constituents of Mining Waste. Under the heading "Concentration," EPA merely makes the statement that "analytical data obtained from surface tailings samples and subsurface tailings samples showed considerable variation" and then lists the ranges of data illustrating the variation of the data. This representation of

concentration does not address the requirements of the Special Study Waste consideration. The EPA has only reported the concentrations of metals as elements and has not considered that these substances are sulfide compounds. As discussed previously, the metals found at the Richardson Flat tailings are not found in their elemental form in the tailings but as sulfide compounds of low toxicity. Therefore, EPA has not addressed the concentrations of the hazardous constituents within the tailings. In addition, the EPA does not address the concentration of the compounds as constituents of any tailings released from the site.

EPA's ranges for the various metals are derived from just four tailings samples. Clearly, four samples of a volume material of unknown depth spread over an area estimated by EPA to be 160 acres cannot accurately represent the concentration of the constituents in the tailings at the site. This is particularly true when the EPA admittedly seeks to find the most contaminated sample at a site. Likewise, as discussed previously, EPA's surface and subsurface samples were tested for cyanide and total solids at the Versar, Inc. lab, which has provided no quality assurance data for its lab results.

In its Addendum, EPA has not accurately addressed the factor of concentration of the actual constituents of the tailings, as required under Section 105(g)(2)(B) of SARA.

(4) The Extent of or Potential for Release of Such Hazardous Constituents of the Mining Waste. In its Addendum under the heading "Releases," EPA notes a surface water release. However, as previously discussed, no surface water sample downstream from Richardson Flat tailings was obtained by EPA's contractor and, therefore, no surface water release has been documented.

EPA additionally comments that "Continued releases to each migration pathway are likely since there is no liner beneath the tailings, there is no protective cover over them and an intermittent stream flows through the site." EPA fails to recognize that approximately 70% of the exposed tailings have now been covered with top soil by United Park pursuant to a program initiated by United Park in 1983 to mitigate the dust problem. This program has since been included in the Best Management Practices requirements of United Park's NPDES permit. In the future, all of the exposed tailings will be covered and seeded.

The "intermittent stream" referred to by the EPA in its Addendum is actually a man-made diversion ditch constructed under the direction of and approved and permitted by the Utah State Department of Health in 1974. It does not flow "through" the tailings impoundment. The ditch was designed to divert naturally occurring surface runoff around the tailings impoundment. The

EPA has failed to consider this available information when considering the potential for release from the site.

(5) The Exposure or Potential Exposure to Human Population and the Environment. In its Addendum under the heading "Exposures," EPA admits there is no human exposure to the groundwater and surface water routes. However, the EPA utilizes the HRS scoring model, rather than actual facts, to state that "the air exposure route is the most critical since approximately 4500 people reside permanently within a four-mile radius of the site."

The EPA fails to state the site-specific facts relating to human exposure via the air route. First, the 1988 Prospector Square Air Report showed that measurable levels of contaminants were not blown the 1.5 mile distance from Richardson Flat to Prospector Square by winds with average speeds of 10 to 30 miles per hour.[5/] Second, there are hills 400-600 feet high which separate Richardson Flat from Park City, but the airflow path between Richardson Flat and Prospector Square is fairly unrestricted. Central Park City is also at least one mile

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5/ EPA policy allows for the consideration of additional data while a site is proposed for listing on the NPL. See Memorandum dated February 12, 1987, from Henry L. Longest II, Director, Office of Emergency and Remedial Response, to Alexandra Smith, Acting Regional Administrator, Region VIII, Subject: Silver Creek Tailings Site, Park City, Utah, at p.1.

farther from Richardson Flat than is Prospector Square. Therefore, if no impacts from Richardson Flat were observed at Prospector Square during the 1987 air sampling, any impacts from Richardson Flat upon Park City would be highly unlikely. Third, the 1988 Prospector Square Air Report determined that mean lead concentrations 200 feet from the Prospector Square tailings site were 66.5% of those observed adjacent to the site. Assuming similar behavior at the Richardson Flat site, the highest lead level observed 200 feet off-site would be only 1.0958 $ug/m^3$. This 24-hour reading would be considerably below the NAAQS quarterly standard of 1.5 $ug/m^3$.

Consequently, if EPA would consider the available, site-specific facts, it would conclude that neither the population of Park City nor the population of Prospector Square are exposed, or potentially exposed, to the air route from Richardson Flat.

Under the heading "Exposure," EPA also stated that the most direct exposure to the air pathway is experienced by "recreational motorcyclists" riding on the tailings pond. It is important to note that all recreational motorcyclists riding on Richardson Flat tailings are doing so illegally and are uninvited trespassers on private property. Richardson Flat tailings is posted as private property and signs forbid trespassing on the

property. United Park employees patrol the area and evict trespassers. United Park is currently evaluating the appropriate method of fencing the area to further restrict access to the site.

Likewise, United Park has presently covered approximately 70% of the exposed tailings with topsoil and soon will have all of the tailings covered and seeded. Therefore, the current population exposed by the air route is not the entire population of Park City but only those few trespassers who choose to disregard the law. In the near future when 100% of the tailings are covered and vegetated, there will be little, if any, human exposure to the air route.

(6) The Degree of Hazard to Human Health or the Environment Posed by the Release of Such Hazardous Constituents at the Facility. In its Addendum under the heading "Hazard to Human Health and the Environment," EPA has again failed to apply the available, site-specific facts to the issue of hazard to human health and environment. EPA states there is significant potential for harm for "nearby residents" and "recreational motorcyclists." The facts are that there are no "nearby residents" with one-half mile of the tailings pond. The 1988 Prospector Square Air Report shows that contaminants are not blown the 1.5 miles from Richardson Flat to Prospector Square. Second, there is no

evidence that the National Ambient Air Quality Standards ("NAAQS") are being violated, even on the Richardson Flat site itself, so trespassing motorcyclists are not exposed to harm via the air route.

Finally, the EPA cannot claim humans are indirectly exposed to harm via the surface water irrigation of forage crops, since the EPA has collected no water sample downstream from Richardson Flat and, thus, has shown no release.

It is also important to note that no persons reside on the Richardson Flat tailings. Many people do reside, however, on the Prospector Square tailings. The Agency for Toxic Substances and Disease Registry ("ATSDR"), after extensive testing, has found that no person will suffer harmful effects from residing in Prospector Square (the closest residential area to Richardson Flat), and that children residing in Prospector Square had blood levels for lead that were approximately one-half of the national level for lead.

Therefore, the available, site-specific facts show that the Richardson Flat tailings pose no hazard, or potential hazard, to human health or the environment.

IV. CONCLUSION.

EPA's HRS score for the Richardson Flat tailings was prepared on the basis of significant factual errors and incorrect

assumptions. When such errors are made in scoring a site, the site should be rescored before such errors cause the site to be erroneously added to the NPL. When MSE rescored the site using correct factual information and assumptions pursuant to guidelines in the HRS Users Manual, the $S_M$ score is significantly lower than 28.5. Consequently, Richardson Flat should not be listed on the NPL.

In addition, in order to accurately and fairly assess the Richardson Flat tailings site, the EPA should use the revised HRS to score Richardson Flat, just as it has decided to use the revised HRS to score the Prospector Square tailings site. EPA's use of the existing HRS to score the Richardson Flat tailings site is arbitrary, capricious and an abuse of its discretion.

Finally, the EPA has failed to comply with Sections 105(g)(2)(A) and 105(g)(2)(B) of SARA (42 U.S.C. § 9605(g)(2)(A) and (B)) and the clear intent of Congress under this statute. Because EPA has not fulfilled the requirements of the statute and has not given proper notice of the requisite findings, it does not have the legal authority to add the Richardson Flat site to the NPL.

DATED this 22nd day of August, 1988.

Respectfully submitted,

Rosemary J. Beless

Rosemary J. Beless
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a Professional Corporation
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215 South State Street
P.O. Box 510210
Salt Lake City, Utah 84151
(801) 531-8900

Attorneys for United Park
City Mines Company

CERTIFICATE OF SERVICE

I hereby certify that I caused the foregoing Comments of United Park City Mines Company in Opposition to Proposed Rule, in the Matter of the Proposed Listing of Richardson Flat Tailings, Summit County, Utah, on the National Priorities List, to be delivered, via Federal Express, this 22nd day of August, 1988, to the following:

Stephen Lingle, Director
Hazardous Site Evaluation Division
(Attn: NPL Staff)
Office of Emergency and
Remedial Response (WH-548A)
U.S. Environmental Protection Agency
401 M Street SW.
Washington, D.C. 20460

Rosemary J. Beless

RJB:081788A

ENVIRONMENTAL PROTECTION AGENCY
Environmental Services Division

# CHAIN OF CUSTODY RECORD

REGION 8
1860 Lincoln Street
Denver, Colorado 80295

PROJ. NO. RS-8505-27 | PROJECT NAME Richardson Flat Tailings

SAMPLERS (Signature) Thomas L. Kennedy, Jr. / Jean C Kennedy

| STAT. NO. | DATE | TIME | COMP | GRAB | STATION LOCATION | NO. OF CONTAINERS | 8-oz glass jar | 1-2 poly | REMARKS: Type of Analysis | REMARKS: Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| RT-SW-1 | 6/19/85 | 1510 | X | | Upgradient Background | 1 | 1 | | Total Metals / Cyanide | 1 jar for both analyses |
| RT-SW-4 | 6/19/85 | 1540 | X | | SE portion of tailings | 1 | 1 | | | |
| RT-SW-5 | 6/19/85 | 1545 | X | | mid-portion of tailings | 1 | 1 | | | |
| RT-SW-6 | 6/19/85 | 1555 | X | | west portion of tailings | 1 | 1 | | | |
| RT-SW-7 | 6/19/85 | 1630 | X | | mid-upper tailings | 1 | 1 | | | |
| RT-SW-1 | 6/20/85 | 1055 | | X | Upstream Background Silver Creek | 2 | | 2 | Total Metals and Sulfate | 1 pair per analysis |
| RT-SW-2 | 6/20/85 | 1245 | | X | Silver Creek by RR track | 2 | | 2 | | |
| RT-SW-3 | 6/20/85 | 1110 | | X | Keetley Junction Tunnel | 2 | | 2 | | |
| RT-SW-4 | 6/20/85 | 1025 | | X | SE Tailings, Intermittent Stream | 2 | | 2 | | |
| RT-SW-5 | 6/20/85 | 1220 | | X | Int. Stream; 60' Downstream | 2 | | 2 | | |
| RT-SW-6 | 6/20/85 | 1240 | | X | Int. Stream, @ culvert | 2 | | 2 | | |

Note The above samples are split samples collected by E.E (FTG) for Utah Park City Mines

| Relinquished by: (Signature) | Date / Time | Received by: (Signature) | Relinquished by: (Signature) | Date / Time | Received by: (Signature) |
|---|---|---|---|---|---|
| [illegible] | 6/20/85 | [illegible] | | | |
| Relinquished by: (Signature) | Date / Time | Received by: (Signature) | Relinquished by: (Signature) | Date / Time | Received by: (Signature) |
| Relinquished by: (Signature) | Date / Time | Received for Laboratory by: (Signature) | Date / Time | Remarks | |

Distribution: Original Accompanies Shipment, First Copy to Coordinator Field Files, Second Copy to Representative of Inspected Facility

Special Samples: Accepted / Declined

Signature

Salt Lake Times, Inc. EXHIBIT P

8-

STATE OF UTAH- PARTMENT OF SOCIAL SERVICES

EXHIBIT B

Salt Lake Tribune, Inc.

PAUL S. ROSE
Executive Director

DIVISION OF HEALTH
44 MEDICAL DRIVE
SALT LAKE CITY, UTAH 84113
AREA CODE 801
328-6146

Board of Health
Conservation Committee
Health Facilities Council
Medical Examiner Committee
Nursing Home Advisory Council
Water Pollution Committee

LYMAN J. OLSEN, M.D., M.P.H.
Director of Health

BUREAU OF ENVIRONMENTAL HEALTH
72 East 4th South
Salt Lake City, Utah

May 29, 1974

Frank W. Millsaps
Concentrator Supt.
Park City Ventures
Star Route No. 1 Box 40
Heber City, Utah 84032

Dear Mr. Millsaps:

We have completed review of the Dames & Moore Report 8998-003-06 on the Park City Ventures Corporation Proposed Tailings Pond Development, and your letters of April 23, 1974, and May 13, 1974.

As a result, the plans for this tailings pond are approved and a construction permit, as constituted by this letter is hereby issued subject to the following conditions:

1. Monitoring results of Silver Creek, the Diversion ditch and the Monitoring wells should be submitted to this office.

2. At least two feet of freeboard shall be maintained during periods of tailings disposal.

This proposal is for an embankment, dikes and a diversion ditch to totally contain the mill tailings. The embankment is to be built to a height of approximately 40 feet on the northwest corner of the existing tailings disposal area. It is to be constructed with a cutoff trench to bedrock, a zone of silty or sandy clay, and a zone of silty sands and gravels having a slope of 2 horizontal to 1 vertical. In addition approximately 5,300 feet of dikes will be built to contain the tailings. This proposal also specifies a runoff diversion ditch at least 50 feet outside of the dikes.

Since this proposal is for an embankment greater than ten feet high and covers an area greater than 20 acres, you should also clear your plans with the State Division of Water Rights before commencing construction. The single set of plans received has been placed in our files.

Very truly yours,

UTAH WATER POLLUTION COMMITTEE

Calvin K. Sudweeks,
Executive Secretary

SMcN:sb
cc: EPA Denver - Evan Dildine
EPA Salt Lake - Cecil Carroll
State Division of Water Rights
Morgan - Summit County Health Dept.

UNITED PARK CITY MINES COMPANY

309 KEARNS BUILDING
SALT LAKE CITY, UTAH 84101

July 18, 1985

Mr. Jeffrey A. Holcomb
Ecology and Environment, Inc.
4105 East Florida Avenue
Suite 350
Denver, Colorado 80232

Dear Mr. Holcomb:

As per our telephone conversation of July 12, 1985, I have determined the present depths of each of the monitoring wells located along the toe of the containment dam for the tailings pond at Richardson Flat. The information is on the attached map.

As I mentioned on the telephone, it would be rather difficult to determine the exact amount of tailings in the Richardson Flat area. The area was used by various mining companies prior to the incorporation of United Park City Mines Company in 1953. United Park has not operated a mill in the area at any time since its incorporation. The most recent use of the area for tailings disposal was during the period of time from 1975 to 1981. During this time United Park had all of its mining properties leased to either Park City Ventures or Noranda Mining Incorporated. These companies constructed and operated milling facilities on United Park's property.

After a review of Park City Ventures' and Noranda's production data, I found that it would take a very detailed study of a variety of mining and milling data to determine, as accurately as possible, the amount of tailings disposed of by these companies.

As I mentioned an approximation of the total amount of tailings in the area could be made by doing some very general surface mapping and volume calculations. If you decide you would like to do this, let me know and I will assist you all that I can.

As of this writing I have not heard from your field crews regarding the drilling in the area. I am still awaiting any word as to the start of that project.

Sincerely,

Kerry C. Gee
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# HRS Evaluation
# For Richardson Flat Tailings
# Park City, Utah

Prepared For

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## INTRODUCTION

The MultiTech Division of MSE, Inc., an environmental and engineering consulting firm in Butte, Montana, has reviewed the Hazard Ranking System (HRS) Scores proposed by the EPA for the Richardson Flat tailings site near Park City, Utah. This report presents the results of that review. The HRS scoring was calculated by Ecology & Environment, Inc., (E&E) an EPA contractor, after performing two site investigations. The following scores were calculated for the Richardson Flat site by E&E:

| | |
|---|---|
| Groundwater Route ($S_{gw}$) | = 0.0 |
| Surface Water Route ($S_{sw}$) | = 47.27 |
| Air Route ($S_a$) | = 48.46 |
| Composite Migration Score ($S_M$) | = 49.13 |
| Fire and Explosion ($S_{FE}$) | = 0.0 |
| Direct Contact ($S_{DC}$) | = 12.5 |

Since the composite migration score ($S_M$) exceeded 28.5, the EPA proposed the Richardson Flat tailings site for inclusion on the NPL (Federal Register, Vol. 53, No. 122, 6/24/88).

Since 1982, with the original CERCLA legislation, sites have been scored using an HRS developed by Mitre Corporation for the EPA. This HRS assigns weighted numerical values to factors supposedly indicative of the relative potential for threats to human health or the environment posed by a facility. The reauthorization of this legislation in 1986 (SARA) included a directive for the EPA to revise this ranking system by October 1988. One of the primary concerns leveled at the 1982 HRS was that sites with a large amount of low concentration wastes (such as mining wastes) were scoring very highly and not accurately

reflecting the relative threat to human health and the environment. Also included in the 1986 bill was the creation of a category of "special wastes" (which includes mining wastes) set aside for further study.

Clearly, the legislation intended to treat these special wastes differently. It is inappropriate, therefore, to score this and other mine waste sites using the old (1982) HRS. It would be more appropriate to use the congressionally mandated revised HRS to score the Richardson Flat tailings site and other mining waste sites. However, the new HRS has not been promulgated by the EPA as of August 15, 1988, even in a preliminary or draft form.

HRS Evaluation

The Richardson Flat tailing site HRS score, as presented by E&E, is flawed by several technical errors and incorrect assumptions. The following narrative of MSE's rescores this site using more accurate technical information and assumptions. Data and references used include the following:

1) Uncontrolled Hazardous Waste Site Ranking System - A Users Manual; EPA 1984.

2) Documentation Records for Hazard Ranking System, provided by EPA for Richardson Flat tailings site.

3) Analytical Results Report for Richardson Flat Tailings; E&E Inc., 10/25/85.

4) Report of Sampling Activities for Richardson Flat Tailings; E&E Inc., 9/30/85.

5) Dangerous Properties of Industrial Materials, 6th ed. N.I. Sax, 1984.

6) Analytical Results Report of Air Sampling at Richardson Flat Tailings; E&E, Inc. 9/9/87.

7) Analytical Results Report for Ambient Air and Residential Characterization at Prospector Square, Park City, Utah; E&E, Inc., 8/1/88.

8) Preliminary Natural Resource Survey for the Silver Creek Tailings Site: U.S. Department of Interior, BLM, 11/14/86.

9) Site inspection and sample collection done by MSE, Inc., on August 1, 1988. Six water, five stream sediment, and three floodplain tailings samples were collected.

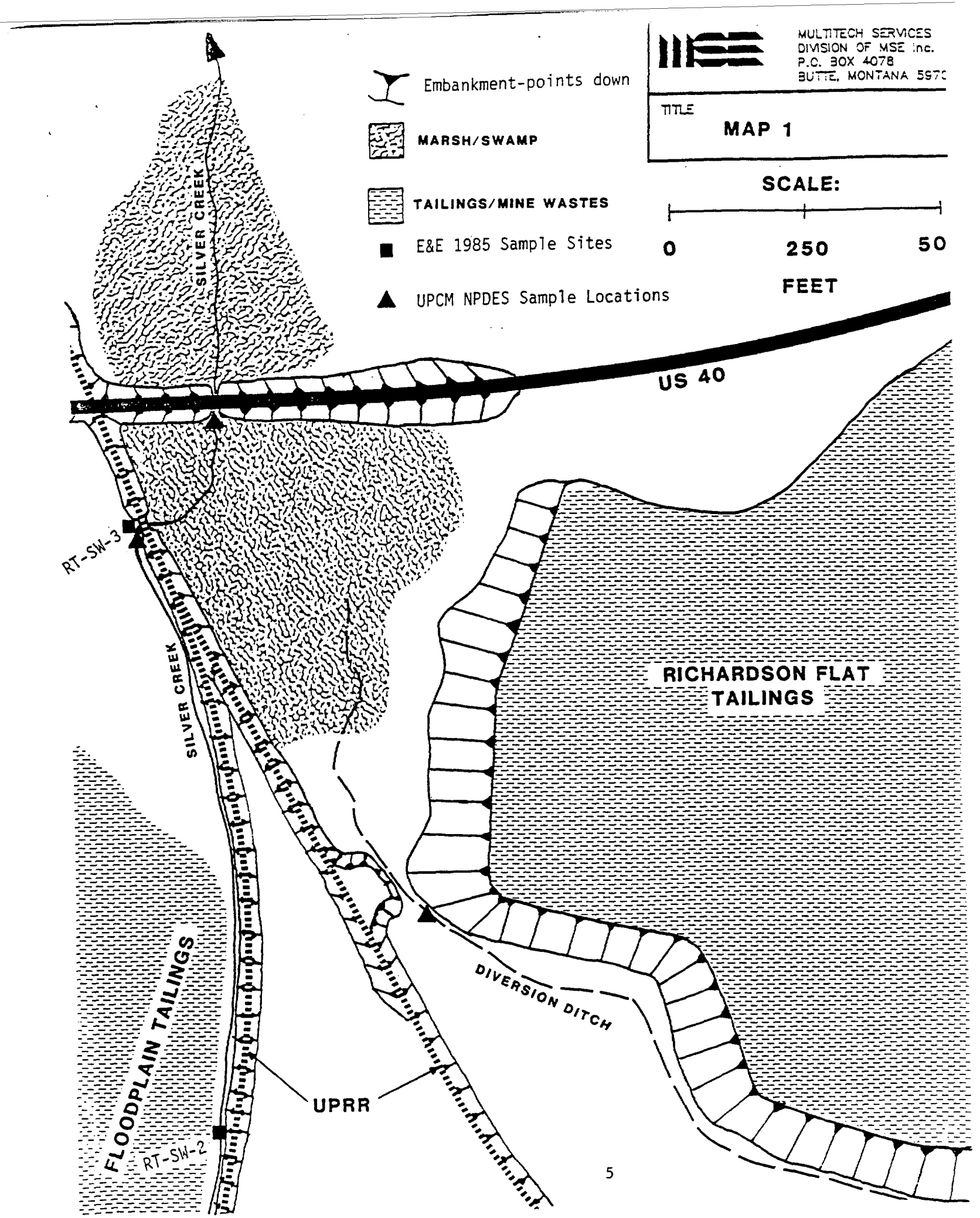
Corrections to EPA-derived scores apply to the surface water route, air route and subsequent composite migration score. The re-evaluation follows the guidelines presented in "Uncontrolled Hazardous Waste Site Ranking System - A Users Manual" developed by Mitre for the EPA, specifically Sections 4.0 (Surface Water Route) and 5.0 (Air Route). Corrected values are tabulated on HRS scoring worksheets (Figures 7, 9, and 10 in the HRS document) and included as Attachment 1.

This more accurate scoring results in a $S_M$ score of 12.63 for the Richardson Flat tailings, well below the threshold score of 28.5 set by the EPA for inclusion of a site on the NPL. Thus, the Richardson Flat tailings site should not be included on the NPL.

## 4.0 SURFACE WATER ROUTE

### 4.1 OBSERVED RELEASE

This score should be 0 since no release has been demonstrated by the data collected during July 1985 by Ecology & Environment (E&E). The sample listed as downgradient (RT-SW-3) was collected at the railroad trestle, per the location map in the Sampling Activities Report, the chain-of-custody forms, and communication with Ms. Sue Kennedy of E&E. This location is, in fact, upgradient from any hydrologic influence of the Richardson Flat tailings (see Map 1). The map provided in E&E's report is grossly in error, and Map 1 illustrates the correct hydrologic and spatial relationships in question. The "downgradient" sample site at the railroad trestle corresponds to United Park City Mines' upgradient NPDES sampling location. As shown on Map 1, any influence from Richardson Flat tailings would enter Silver Creek between the railroad trestle and the culvert under US 40. Any influences from either the diversion ditch through the tailings or seepage beneath the tailings dam would be confined to the marsh between the railroad grade and the highway embankment. The correct sampling locations to measure possible releases from the Richardson Flat tailings correspond to those regularly sampled for NPDES requirements, that is: upstream sample at the railroad trestle and downstream sample at the culvert under US-40. These locations have been regularly sampled since 1977 and analyzed for Total Pb, Mn and Hg. NPDES data are summarized in Table 1, lead is the only element presented since Hg was almost always below detection and Mn is not listed as an element of concern.


MULTITECH SERVICES
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TITLE
MAP 1
Embankment-points down
MARSH/SWAMP
TAILINGS/MINE WASTES
E&E 1985 Sample Sites
UPCM NPDES Sample Locations
SCALE:
0
250
50
FEET
SILVER CREEK
US 40
RT-SW-3
SILVER CREEK
RICHARDSON FLAT
TAILINGS
DIVERSION DITCH
UPRR
FLOODPLAIN TAILINGS
RT-SW-2

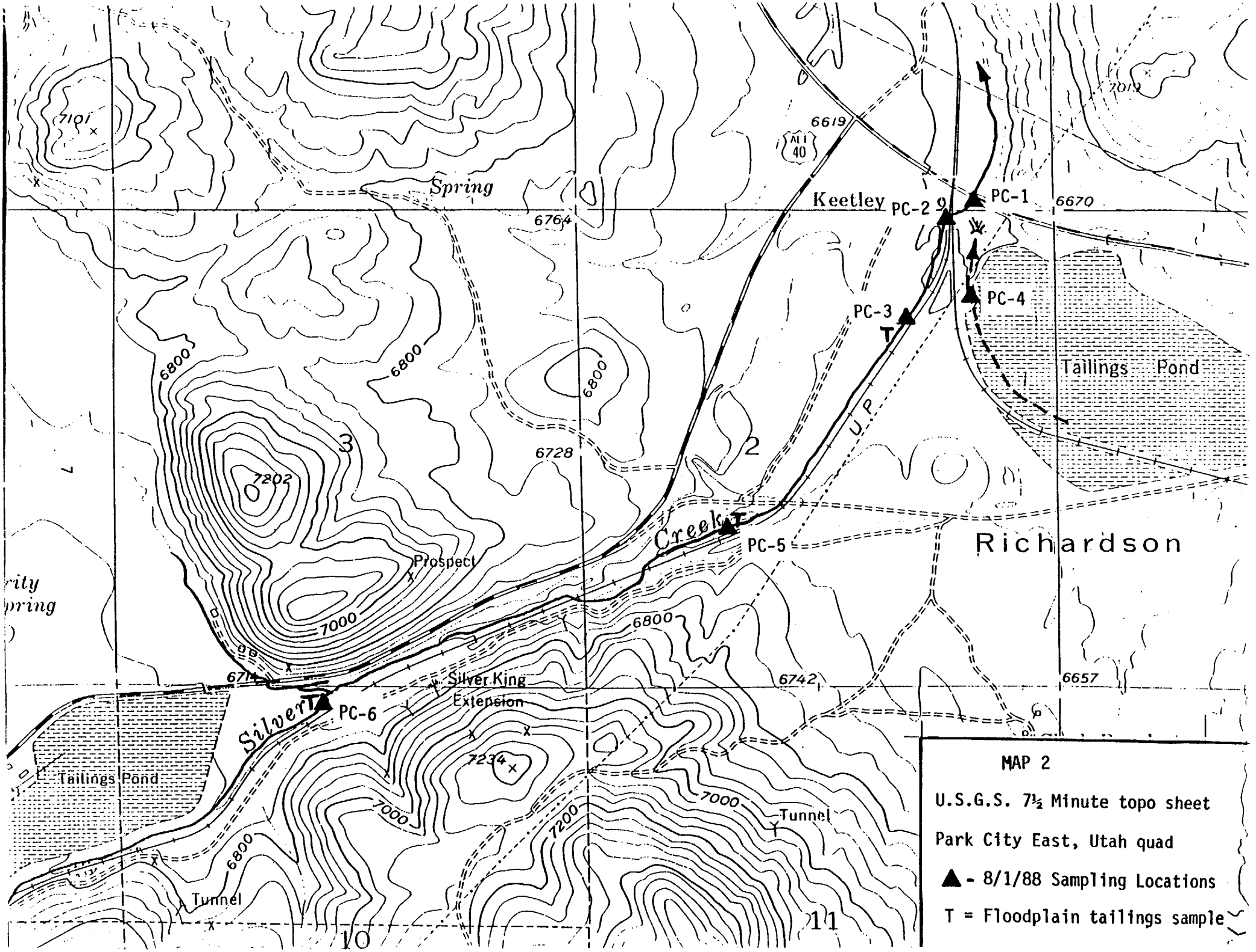
**TABLE 1**

**Mean Total Pb Values for 35 pairs of NPDES Samples Collected on Silver Creek from 1983 to 1988**

| | Railroad Trestle Upstream Location | US-40 Culvert Downstream Location | Difference (Downstream-Upstream) |
|---|---|---|---|
| Total Pb (mg/L) | 0.1418 | 0.1414 | -0.0004 |

The NPDES data has been analyzed statistically using F-tests (analysis of variance) and T-tests (both the two-sample and paired-difference tests). These test results demonstrate conclusively that the upstream and downstream populations are indistinguishable from one another. The two-sample T-Test shows the means of the two populations (upstream and downstream) are not significantly different at the 99.5% confidence level. At the 94% confidence level, the variances are not significantly different either. The paired-difference T-Test shows the average difference between up- and downstream pairs is not significantly different from zero at the 98% confidence level. The mean difference is -0.0004 (upstream is higher). Hence, using existing NPDES data, there is no rationale for suspecting, much less scoring, an "observed release" to Silver Creek from the Richardson Flat tailings.

The difference found between RT-SW-1 and RT-SW-3 in E&E's 1985 sampling is most likely due to entrainment of particulate material from the banks and bedload of Silver Creek. A review of aerial photos, a ground check, and several samples (Map 2) confirm the floodplain downstream from Prospector Square is covered with stream deposited tailings.




MAP 2

U.S.G.S. 7½ Minute topo sheet

Park City East, Utah quad

▲ - 8/1/88 Sampling Locations

T = Floodplain tailings sample

Consequently, the suspended load within Silver Creek can contain these tailings and associated metals. Total metals analyses reflect these suspended tailings in the stream water and show a great deal of variance depending on sampling methodology, sampling locations, and seasonal variables (spring runoff, storms, dry periods, irrigation withdrawls, etc.). These factors can easily account for the high metal concentrations found in RT-SW-3 by E&E in 1985. Filtered water samples are specific to dissolved metals and eliminate the influence of suspended particulate material. These samples provide a more accurate measure of metal content in the water available for uptake by plants, humans, and livestock. Table 2 compares total and dissolved metal concentrations found in Silver Creek on August 1, 1988 (locations correspond to those on Map 2).

**TABLE 2**

**Comparison of Total and Dissolved Metals In Silver Creek on August 1, 1988**

| Silver Creek Water Sample # | Total Pb ug/L | Diss. Pb ug/L | Total Hg ug/L | Diss Hg ug/L |
|---|---|---|---|---|
| PC-5 | 101.2 | <0.1 | -- | -- |
| PC-4 | 4.1 | 3.2 | -- | -- |
| PC-3 | 12.1 | 3.5 | 0.4 | <0.1 |
| PC-2 | 111.2 | 9.8 | 1.7 | <0.1 |
| PC-1 | 95.2 | 5.4 | 0.7 | <0.1 |

The data illustrate significant differences exist between dissolved and total metal values at the same sampling location, with total metal concentrations as much as 18 times higher than dissolved metals. These data support the hypothesis that metal levels observed by E&E in 1985 are primarily due to

suspended sediments, probably derived from floodplain and streambank tailings deposits along Silver Creek.

Tailings samples collected on Silver Creek demonstrate that the older, floodplain tailings differ in geochemical character from those at Richardson Flat (Table 3). The Richardson Flat tailings exhibit higher arsenic (3.3x) and manganese (7.3x), while the floodplain tailings show higher lead (1.9x) and mercury (9x). These differences are probably due to several different factors.

**TABLE 3**

**Tailings Composition Comparison (Measurements in ppm)**

| | As | Pb | Hg | Mn |
|---|---|---|---|---|
| Richardson Flat Tailings(1) | 1207 | 4833 | 1.31 | 3498 |
| Silver Creek Flood Plain Tailings(2) | 367 | 9213 | 11.74 | 480 |

(1) Mean value of six samples collected in 1985 by E&E and presented in their Analytical Results Report, dated 10/25/85.

(2) Mean value of three samples collected on 8/1/88 and analyzed in MSE's laboratory following EPA CLP protocols.

The ratio of Pb to As is also distinctive between the two tailings as is the Hg concentration. Comparison of the Pb/As ratio found in water samples from Silver Creek to those in the two tailings can yield a probable source of metals in the stream (Table 4).

**TABLE 4**

**Comparison of Pb/As Ratios and Hg Concentrations**

| | Pb/As Ratio | Hg concentration |
|---|---|---|
| Richardson Flat Tailings | 4.0 | 1.31 ppm |
| Silver Creek Floodplain Tailings | 25.1 | 11.74 ppm |
| Silver Creek Water RT-SW-3 (1985, E&E) | 30.5 | 0.57 mg/L |
| Stream Sediments in Silver Creek(1) | 24.5 | 2.45 ppm |

(1) Mean value of five sediment samples collected in Silver Creek on 8/1/88 between Prospector Square tailings and the railroad trestle at Keetley Junction.

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Using the similarity in Pb/As ratios and Hg concentrations it can be demonstrated that metals in the sediments and water of Silver Creek are probably derived from floodplain tailings. Stream sediment data (Table 5) also clearly demonstrate a decay of metal concentrations with distance from Prospector Square tailings, indicating that they, not Richardson Flat, are the source of metals to Silver Creek, both in the past (floodplain tailings) and currently (E&E 1985 surface water data, and 8/1/88 surface water data).

TABLE 5

**Stream Sediment Data (in ppm) collected on August 1, 1988 at locations on Map 2**

| Station | As | Pb | Hg | Cu | Mn |
|---|---|---|---|---|---|
| PC-6 | 200 | 5,320 | 3.88 | 260 | 840 |
| PC-5 | 220 | 4,750 | 2.37 | 200 | 1510 |
| PC-3 | 190 | 6,650 | 2.77 | 200 | 1660 |
| PC-2 | 200 | 3,660 | 1.69 | 340 | 1810 |
| PC-1 | 140 | 2,970 | 1.53 | 170 | 1280 |

The Prospector Square and associated floodplain tailing deposits, therefore, are responsible for the "observed release" in 1985 and continue to be a source of metals to Silver Creek, especially during higher flows.

In summary, the 1985 sampling along Silver Creek was clearly flawed. A downstream sample was not collected, and hence, no release can be attributed to Richardson Flat. NPDES data properly collected in up- and downstream locations show no statistically significant difference between upstream and downstream stations. The increase observed in 1985 can be attributed to floodplain and streamside tailings, which originated upstream and reside in Silver Creek's floodplain between Prospector Square and Richardson Flat.

Since no direct evidence of an observed release was documented, Section 4.2 (Route Characteristics) must be evaluated instead.

## 4.2 ROUTE CHARACTERISTICS

a) Facility Slope and Intervening Terrain

Table 8, p. 31 indicates a score of 0 for this factor. The Richardson Flat tailings are a closed basin. Any rainwater falling on the tailings is contained on the tailings and cannot escape to surface water. The diversion ditch is also diked to prevent tailings runoff from draining into it. Higher intervening terrain (dikes) isolates the tailings from surface water. The score for this factor then, is clearly 0.

b) 1-yr, 24-hr Rainfall

Using the map on page 33 (Figure 8), the area may receive 1.25 inches of rain in a 24-hr period. The assigned value from p. 32 is 1.

c) Distance to Nearest Surface Water

The distance from the Richardson Flat tailings to Silver Creek is less than 1,000 feet, resulting in an assigned value of 3 for this factor.

d) Physical State

Using the table on p. 16 (section 3.2), the physical state of the Richardson Flat tailings is a solid, unstabilized/unconsolidated material. This results in an assigned value of 1. Using the appropriate HRS multipliers, the Total Route Characteristics (4.2) score is 8.

## 4.3 CONTAINMENT

As defined on Table 9, p. 35, the Richardson Flat tailings are considered a Surface Impoundment (group A). The impoundment has sound diking and sound diversion structure (ditch) but may have inadequate freeboard for very large precipitation events. Accordingly, the assigned value is 1.

## 4.4 WASTE CHARACTERISTICS

a) Toxicity/Persistence

The HRS requires the evaluation of substances in the form in which they exist at the site. The form of metals found in the tailings is important with respect to toxicity. The metals in tailings are found primarily as sulfide compounds not in elemental forms as assumed in the previous scoring. Sax, 6th Ed. (p. 2,482) states "sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide." Toxicity, therefore, should be assigned a value of 1. Sulfide minerals are not easily degraded and should be assigned a persistence value of 3. The matrix on page 18 then shows the combined Toxicity/Persistence value to be 12.

b) Waste Quantity

The actual amount of hazardous material, such as lead or arsenic, is not accurately estimated using merely the total volume of tailings at the site. The tailings contain a great deal of non-hazardous materials such as country rock (limestone) and other metal sulfides. Using the actual amounts of these hazardous constituents of the waste, as stipulated in regulations concerning special study wastes, may yield a significatly

lower assigned value for waste quantity. A large amount of low concentration sulfide tailings do exist on the site, probably greater than 2,500 cubic yards. The assigned value, in the absence of more appropriate volumes, is then 8.

The Total Waste Characteristics (4.4) score is 20.

## 4.5 TARGETS

a) Surface Water Use

The only use of Silver Creek water is for irrigating pasture crops, which yields an assigned value of 2.

b) Distance to Sensitive Environment

No sensitive environments or critical habitats have been identified within one mile, yielding an assigned value of 0.

c) Population Served by Surface Water

Review of irrigation practices downstream on Silver Creek indicate the only usable irrigation diversion is more than 2,000 feet downstream from the culvert under US-40. The actual acreage irrigated should be verifed and actual irrigation practices rather than water rights information should be considered. However, the population served (using the 1.5 person/acre calculation) value used by E&E will be used here - 474 persons (316 acres). The matrix on page 38 then yields an assigned value of 16. Using the appropriate multipliers, the Total Targets (4.5) score is 22.

## 4.6 CALCULATE SURFACE WATER ROUTE SCORE

Multiplying the values from Sections 4.2, 4.3, 4.4, and 4.5 yields 8x1x20x22=3520.

Dividing by 64,360 and multiplying by 100 yields a $S_{SW}$=5.47

## 5.0 AIR ROUTE

### 5.1 OBSERVED RELEASE

The primary piece of evidence used to document the "observed release" is data collected during one day of a five-day air sampling during July 1986. This one day is not representative of either the direction or magnitude of winds at the site, considering the rest of the data collected during that week. It was noted in E&E's report that the downwind station exceeded the ambient lead standard of 1.5 $ug/m^3$ during that single 24-hour period. It should be clarified that the EPA ambient lead standard is a quarterly (3-month) average, not a 24-hour standard. A 24-hour standard does not currently exist. If the measurements for the downwind station (AM-04) are averaged for the entire sampling period in July, the result is 0.38 $ug/m^3$, roughly 25% of the quarterly standard. However, according to the guidelines for scoring the HRS, standards do not need to be exceeded, only that they "significantly exceed background levels". The fact that this occurred only once during the sampling period during an unusual storm event is also irrelevant according to the HRS: "regardless of the frequency of occurrence". The tailings are currently 70% covered with topsoil and will be completely covered in the future. This will preclude the airborne release of tailing materials from Richardson Flat.

Even though the HRS scoring guidelines are clearly lacking in technical merit, an observed release can be scored based on the one day of data collected. The score for Section 5.1 should be 45, given the current guidelines.

## 5.2 WASTE CHARACTERISTICS

a) Reactivity and Incompatibility

Although arsenic is in the tailings, its form is not elemental As. It is tied up within a sulfide mineral matrix and cannot be considered a reactive compound. No incompatible substances are present at the site. The assigned value for this factor is 0.

b) Toxicity

Again, metals at the site are not in elemental forms; they are primarily tied up as sulfides. Sax, 6th edition, states, "Sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide". Therefore, these sulfide compounds should be given a toxicity rating of 1.

c) Waste Quantity

There are probably more than 2,500 cu. yds. of tailings materials at the site. It is inappropriate, though, to include non-hazardous components of the waste as discussed previously (section 4.4b). Assigned value is 8.

Using the HRS multipliers, the Total Waste Characteristics (5.2) score is 11.

## 5.3 TARGETS

a) Population within a four-mile radius

The original scoring includes the entire population of Park City, Utah, disregarding the intervening mountains and considerable evidence that

Prospector Square (1.5 miles away) and Park City beyond are not affected by tailings at Richardson Flat. The 1988 Prospector Square report (Franzen) analyzed data collected on three sampling days when the Prospector Square tailings were downwind from the Richardson Flat tailings to determine whether entrained metals from Richardson Flat contributed to contaminant levels at Prospector Square. The conclusion was "it therefore appears that measurable levels of contaminants were not blown the 1.5 mile-distance between the two sites by winds with average speeds of 10 to 30 miles per hour".

The airflow path between the Richardson Flat and Prospector Square sites is fairly unrestricted, while Richardson Flat and Park City are separated by hills 400 to 600 ft high. No impacts were observed at Prospector Square during 1987 sampling; hence, impacts to Park City would be highly unlikely (Park City is at least one mile further from Richardson Flat than Prospector Square).

The Franzen report also examined variations in metal levels with distance from the Prospector Square site. It was determined that mean lead concentrations 200 feet from the tailings site were 66.5% of those observed adjacent to the site. Assuming similar behavior at the Richardson Flat site, the highest lead level observed 200 feet off-site would be only 1.0958 $ug/m^3$ (versus the 1.6478 $ug/m^3$ level observed on site). This 24-hour reading would be considerably below the quarterly standard of 1.5 $ug/m^3$.

In summary, while there is good evidence that increased metal concentrations can occur immediately downwind of the Richardson Flat

tailings, these have been shown to be unmeasurable at a distance of 1.5 miles over unrestricted terrain. It also appears that ambient lead levels, even during extreme conditions, decrease rapidly with distance off-site. There is no evidence that National Ambient Air Quality Standards for lead are being violated, even on-site.

The current HRS guidelines do not consider the demonstrated unmeasurable effects on populations (Prospector Square air monitoring results). However, data clearly demonstrate Richardson Flat tailings do not pose a health hazard to Park City residents. Since these tailings are special study wastes, a potential hazard to human health or the environment must be demonstrated. Clearly, the 1988 Prospector Square Air Monitoring data prove that no health hazard exists and no standards were exceeded in the vicinity of Park City due to Richardson Flat tailings. Hence, that population can not be included as targets of an actual or potential release of airborne contaminants from Richardson Flat tailings. The actual target population is less than 100 persons within a one-mile radius of the site, resulting in an assigned value of 12.

b) Distance to a Sensitive Environment

Sensitive environments or critical habitat do not exist within one mile of the site. The assigned value is 0.

c) Land Use

Agricultural land is within 1/4 mile of the site. Assigned value is 3.

The Total Targets (5.3) Score, using a more justified, affected population of less than 100 persons within 1 mile, is 15.

## 5.4 CALCULATE AIR ROUTE SCORE

Multiply the scores from Sections 5.1, 5.2, and 5.3.

45x11x15=7,425

Dividing by 35,100 and multiplying by 100 gives:

$S_a$ = 21.15

## COMPOSITE MIGRATION SCORE

Using Figure 10 to compute $S_M$ yields:

| | $S$ | $S^2$ |
|---|---|---|
| $S_{gw}$ | 0 | 0 |
| $S_{sw}$ | 5.47 | 29.92 |
| $S_a$ | 21.15 | 447.32 |
| $S_M$ | | 12.63 |

The $S_M$ score for the Richardson Flat tailings is not nearly high enough to meet the criteria set by EPA for inclusion on the NPL ($S_M$>28.5).

Additionally, the Direct Contact score should be reduced to zero since the tailings are currently 70% covered with topsoil and will be completely covered in the near future.

ATTACHMENT 1

HRS SCORING WORKSHEETS

| Surface Water Route Work Sheet | | | | | |
|---|---|---|---|---|---|
| Rating Factor | Assigned Value (Circle One) | Multi-plier | Score | Max. Score | Ref. (Section) |
| 1 Observed Release | (0) . . 45 | 1 | 0 | 45 | 4.1 |
| If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2. | | | | | |
| 2 Route Characteristics | | | | | 4.2 |
| Facility Slope and Intervening Terrain | (0) 1 2 3 | 1 | 0 | 3 | |
| 1-yr. 24-hr. Rainfall | 0 (1) 2 3 | 1 | 1 | 3 | |
| Distance to Nearest Surface Water | 0 1 2 (3) | 2 | 6 | 6 | |
| Physical State | 0 (1) 2 3 | 1 | 1 | 3 | |
| Total Route Characteristics Score | | | 8 | 15 | |
| 3 Containment | 0 (1) 2 3 | 1 | 1 | 3 | 4.3 |
| 4 Waste Characteristics | | | | | 4.4 |
| Toxicity/Persistence | 0 3 6 9 (12) 15 18 | 1 | 12 | 18 | |
| Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 (8) | 1 | 8 | 8 | |
| Total Waste Characteristics Score | | | 20 | 26 | |
| 5 Targets | | | | | 4.5 |
| Surface Water Use | 0 1 (2) 3 | 3 | 6 | 9 | |
| Distance to a Sensitive Environment | (0) 1 2 3 | 2 | 0 | 6 | |
| Population Served/Distance to Water Intake Downstream | 0 4 6 8 10<br>12 (16) 18 20<br>24 30 32 35 40 | 1 | 16 | 40 | |
| Total Targets Score | | | 22 | 55 | |
| 6 If line 1 is 45, multiply 1 x 4 x 5<br>If line 1 is 0, multiply 2 x 3 x 4 x 5 | | | 3520 | 64,350 | |
| 7 Divide line 6 by 64,350 and multiply by 100 | | $S_{sw}$ = | 5.47 | | |

**FIGURE 7**
**SURFACE WATER ROUTE WORK SHEET**

| Air Route Work Sheet | | | | | |
|---|---|---|---|---|---|
| Rating Factor | Assigned Value (Circle One) | Multiplier | Score | Max. Score | Ref. (Section) |
| 1 Observed Release | 0 · · (45) | 1 | 45 | 45 | 5.1 |
| Date and Location: | | | | | |
| Sampling Protocol: | | | | | |
| If line 1 is 0, the $S_a$ = 0. Enter on line 5. If line 1 is 45, then proceed to line 2. | | | | | |
| 2 Waste Characteristics | | | | | 5.2 |
| Reactivity and Incompatibility | (0) 1 2 3 | 1 | 0 | 3 | |
| Toxicity | 0 (1) 2 3 | 3 | 3 | 9 | |
| Hazardous Waste Quantity | 0 1 2 3 4 5 6 7 (8) | 1 | 8 | 8 | |
| | Total Waste Characteristics Score | | 11 | 20 | |
| 3 Targets | | | | | 5.3 |
| Population Within 4-Mile Radius | 0 9 (12) 15 18 21 24 27 30 | 1 | 12 | 30 | |
| Distance to Sensitive Environment | (0) 1 2 3 | 2 | 0 | 6 | |
| Land Use | 0 1 2 (3) | 1 | 3 | 3 | |
| | Total Targets Score | | 15 | 39 | |
| 4 Multiply 1 x 2 x 3 | | | 7425 | 35,100 | |
| 5 Divide line 4 by 35,100 and multiply by 100 | | $S_a$ = 21.15 | | | |

**FIGURE 9**
**AIR ROUTE WORK SHEET**

| | $S$ | $S^2$ |
|---|---|---|
| Groundwater Route Score ($S_{gw}$) | 0.00 | 0.00 |
| Surface Water Route Score ($S_{sw}$) | 5.47 | 29.92 |
| Air Route Score ($S_a$) | 21.15 | 447.32 |
| $S_{gw}^2 + S_{sw}^2 + S_a^2$ | | 477.24 |
| $\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$ | | 21.85 |
| $\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} \,/\, 1.73 = S_M =$ | | 12.63 |

**FIGURE 10**
**WORKSHEET FOR COMPUTING $S_M$**